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ALBERTA AIR STRATEGY
BASELINE STUDY

CANADIANA

APR 19 1995

PROLOG/DALCOR

ALBERTA AIR STRATEGY BASELINE STUDY

PROLOG/DALCOR

ALBERTA AIR STRATEGY
BASELINE SUPPLY DEMAND STUDY

Submitted to:

THE ALBERTA AIR TRANSPORTATION STRATEGY STEERING COMMITTEE

Submitted by:

DALCOR INNOVENTURES Ltd./ PROLOG PLANNING INC.

August 8, 1994

TERMINOLOGY

Aviation Demand - Aviation demand is reported from an airport activity perspective as the total of enplaned plus deplaned passengers and loaded plus offloaded cargo (US DOT enplaned statistics are doubled to estimate total demand). This demand does not include through passengers and cargo which arrive and depart an airport on the same aircraft. However, it does include passengers who connect or cargo which is trans-shipped between separate aircraft at the same airport. As a result, origin-destination demand for air travel may be overestimated to the extent that passengers or cargo connect through one or more airports within the same market area.

Combi Service - air service by aircraft offering mixed passenger and cargo configurations.

O/D - origin/destination.

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1. INTRODUCTION

The Alberta Air Transportation Steering Committee includes representatives from the three major air carrier airports in Alberta (Calgary International, Edmonton International and Edmonton Municipal) together with the Alberta Departments of Transportation and Utilities and Economic Development and Tourism. The Committee intends to develop a strategic plan for Alberta's air services. As a first step in this process, the Committee agreed to undertake an assessment of the supply and demand for air services into and out of the Province through the major international airports. Dalcor Innoventures Ltd. of Edmonton and Prolog Planning Inc. of Calgary were retained to complete the analysis.

The work program included three major components:

a) Demand Analysis - Historic and current passenger and cargo air transportation statistics in the Pacific Northwest and the historical market share trends for major air carrier facilities in the region were compiled. These baseline demand data were drawn from Statistics Canada, the United States Department of Transportation, International Civil Aviation Organization (ICAO) and recent studies supplemented with unstructured interviews of airport administrators, air carriers, freight forwarders and travel agents.

   Scenario Demand utilized economic variables or specified comparable proxies to evaluate future demand to which the Alberta airport system may have to respond or which the airport system can stimulate. This portion of the work forms the basis for determining future air traffic potential beyond what would otherwise be forecast.

b) Service Analysis - Current capacity, strengths and deficiencies of the three major air carrier airports were inventoried and assessed to determine their relative impact on marketing success.

c) Study Integration - Potential market opportunities together with Alberta's strengths and weaknesses were evaluated to scope potential for major airport synergies as the basis for future development of an Alberta Air Transport Strategy.

The goal for the work is to develop an understanding of the demands and current service capabilities of the Alberta air services market as a baseline from which to identify potential opportunities and to propose strategies for realizing those opportunities.

2. DEMAND ANALYSIS

Alberta has three airports with traffic exceeding 500,000 enplaned/deplaned passengers per year, the Municipal and International Airports in Edmonton and Calgary International Airport. There are also a number of important regional airports throughout the Province. Current throughput for Alberta's larger airports is shown on Table 1 below.

TABLE 1
CURRENT ALBERTA AIRPORTS DEMAND (1992)

	Airport	Passengers enplaned/deplaned	Cargo Tonnes load/offload
1.	Calgary International	4,674,881	41,747
2.	Edmonton International	1,790,553	18,124
3.	Edmonton Municipal	871,943	617
4.	Grande Prairie	83,452	n/a
5.	Lethbridge	82,657	n/a
6.	Fort McMurray	68,617	119
7.	Medicine Hat	45,040	n/a
8.	Peace River	27,992	n/a
9.	Lloydminister (Sask)	15,580	
	Total Alberta	7,660,695	60,607
	Total Canada	62,038,221	690,253

Source: Statistics Canada Catalogue 51-005 Tables 1.1 and 5.1

Total traffic at Alberta airports consists of approximately 7.5 million passengers enplaned and deplaned and approximately 60,500 tonnes of cargo loaded and unloaded. Figure 1 shows Alberta market shares within both a Canadian context and the more relevant Pacific Northwest regional context. Table 2 provides passenger statistics for the major air carrier airports in Alberta and BC for 1983, 1989 and 1992 as well as market shares and changes in market shares over the period.

TABLE 2

Passengers Enplaned/Deplaned - Selected Canadian Airports
Scheduled and Charter
1983, 1989 and 1992

PASSENGERS (enplaned/deplaned)				MARKET SHARE (% of TOTAL)			
1983	Domestic	Transbrdr	Int'l	Domestic	Transbrdr	Int'l	Total
Calgary	2730719	549957	289250	30.4	30.0	21.7	29.4
Edm Muni	695390		401	7.7	0.0	0.0	5.7
Edm Intl	1587410	112370	201466	17.7	6.1	15.1	15.7
Vancouver	3963919	1172546	843491	44.2	63.9	63.2	49.2
TOTAL	8977438	1834873	1334608				
1989	Domestic	Transbrdr	Int'l	Domestic	Transbrdr	Int'l	Total
Calgary	3505327	797532	172368	28.6	25.1	14.2	26.9
Edm Muni	1029584	129		8.4	0.0	0.0	6.2
Edm Intl	1654711	241327	92740	13.5	7.6	7.6	12.0
Vancouver	6052773	2138185	952894	49.4	67.3	78.2	55.0
TOTAL	12242395	3177173	1218002				
1992	Domestic	Transbrdr	Int'l	Domestic	Transbrdr	Int'l	Total
Calgary	3674253	950872	264478	30.4	25.3	13.5	27.5
Edm Muni	872014	3		7.2	0.0	0.0	4.9
Edm Intl	1562938	305946	76515	13.0	8.1	3.9	10.9
Vancouver	5958520	2502562	1618951	49.4	66.6	82.6	56.7
TOTAL	12067725	3759383	1959944				
92/83 %	Domestic	Transbrdr	Int'l	CHANGE IN MARKET SHARE 92/83			
Calgary	34.6	72.9	-8.6	0.0	-4.7	-8.2	-1.9
Edm Muni	25.4			-0.5	0.0	-0.0	-0.8
Edm Intl	-1.5	172.3	-62.0	-4.7	2.0	-11.2	-4.7
Vancouver	50.3	113.4	91.9	5.2	2.7	19.4	7.4
TOTAL	34.4	104.9	46.9				
92/89 %	Domestic	Transbrdr	Int'l	CHANGE IN MARKET SHARE 92/89			
Calgary	4.8	19.2	53.4	1.8	0.2	-0.7	0.6
Edm Muni	-15.3	-97.7		-1.2	-0.0	0.0	-1.3
Edm Intl	-5.5	26.8	-17.5	-0.6	0.5	-3.7	-1.0
Vancouver	-1.6	17.0	69.9	-0.1	-0.7	4.4	1.7
TOTAL	-1.4	18.3	60.9				

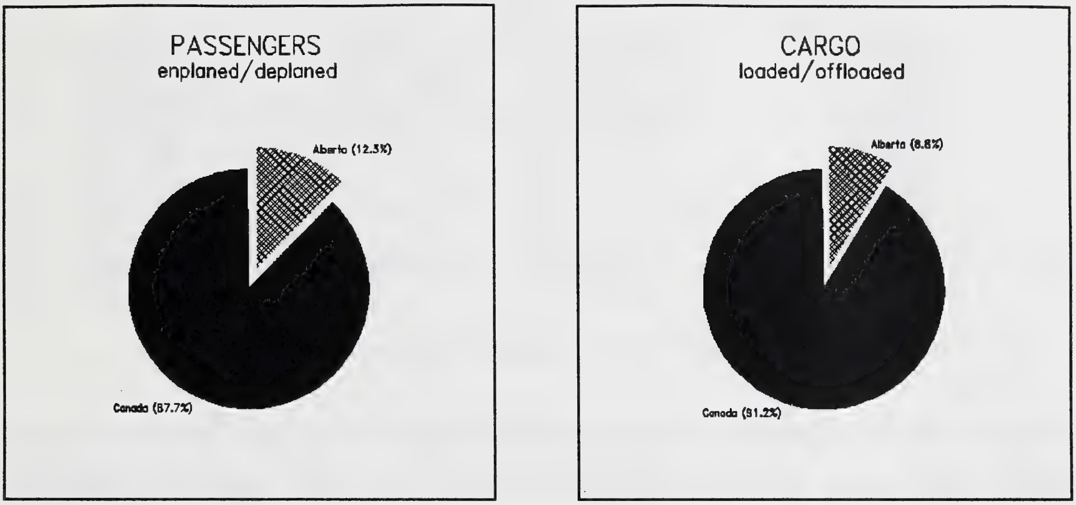
Source: Statistics Canada Catalogue 51-005.

2.1 CANADIAN MARKET. Alberta generates 12% of total passenger traffic and 9% of total cargo traffic in Canada (Table 3). Calgary and Edmonton (International plus Municipal) are the fourth and fifth largest aviation markets in Canada.

FIGURE 1

ALBERTA MARKET SHARES - 1992

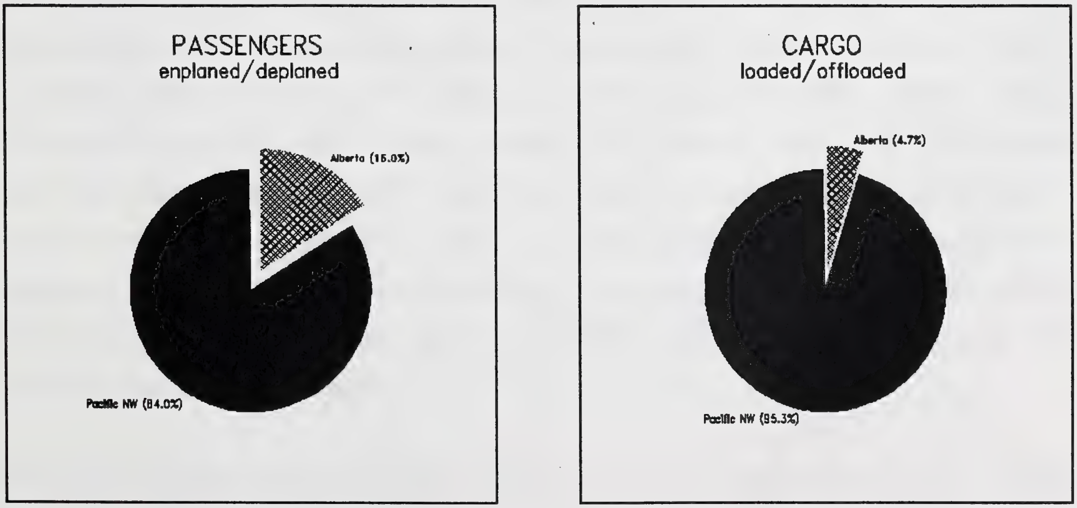
CANADIAN MARKET



62 Million Total Passengers

690,000 Tonnes Total Cargo

PACIFIC NORTHWEST MARKET



48 Million Total Passengers

1,300,000 Tonnes Total Cargo

TABLE 3
TOP TEN CANADIAN AIRPORTS (1992)

	Airport	Passengers enplaned/deplaned	Cargo Tonnes load/offload
1.	Pearson International	19,118,887	299,939
2.	Vancouver International	9,443,225	131,389
3.	Montreal - Dorval Int'l	5,563,282	25,882
4.	**Calgary International**	**4,674,881**	**41,747**
5.	Ottawa International	2,495,746	6,675
6.	Montreal - Mirabel Int'l	2,424,014	87,868
7.	Halifax International	2,310,146	21,546
8.	Winnipeg International	2,142,124	28,352
9.	**Edmonton International**	**1,790,533**	**18,124**
10.	**Edmonton Municipal**	**871,943**	**617**

Source: Statistics Canada Catalogue 51-005 Tables 1.1 and 5.1.

Between 1983 and 1992, air passenger traffic volumes grew in all major markets in Canada other than Winnipeg, Halifax and Edmonton and air cargo traffic grew in all markets except Edmonton. Virtually all Canadian airports lost market share as Vancouver and Toronto established their positions as Canada's national aviation hubs during this period.

2.2 PACIFIC NORTHWEST MARKET. Alberta's position in a continental context is increasingly more significant than Alberta's position in a Canadian context. This is particularly true in terms of the Pacific Northwest region including Alberta, British Columbia, Washington, Idaho, Oregon, Montana and Alaska for which regional economic and trade linkages have grown in importance, and in terms of overseas connections to Europe, Asia and Latin America. The Free Trade Agreement and more recent North American Free Trade Agreement will further increase regional market issues. Accordingly, for a more relevant comparison, we have considered Alberta's market performance with respect to the Pacific Northwest.

To further define a regional passenger and cargo market that extends into the U.S. Pacific Northwest, traffic data for Great Falls, Spokane, Portland, Seattle-Tacoma, Anchorage and

Fairbanks have been obtained from the United States Department of Transportation and directly from airport authorities.

Table 4 provides statistics for the nine major airport markets in the Pacific Northwest Region. It compares traffic throughput for these airports and shows the scale of the U.S. Pacific Northwest passenger and air cargo industry.

The regional market can be considered part of Alberta's catchment area, especially with respect to market leakage of international traffic to and from other airports as regional trade linkages grow in importance.

Table 4
PACIFIC NORTHWEST AIRPORT MARKET DEMAND (1992)

Airport		Passengers enplane/deplaned	Cargo Tonnes load/offload
1.	Seattle/Tacoma Int'l	16,710,022	288,809
2.	Vancouver/Victoria Int'l	10,140,703	131,499
3.	Portland International	7,000,846	97,012
4.	Anchorage/Fairbanks	4,818,716	661,998
5.	**Calgary International**	**4,674,881**	**41,747**
6.	**Edmonton International**	**1,790,553**	**18,124**
7.	Spokane International	1,750,722	22,010
8.	**Edmonton Municipal**	**871,943**	**617**
9.	Great Falls Int'l	262,862	14,303
	Regional Market Demand	48,021,248	1,276,119
	Canadian Market Demand	62,038,221	690,253
	Regional Market (% of Cdn market)	(77%)	(185%)

Source: Statistics Canada Catalogue 51-005,
U.S. Department of Transportation & airport authorities
Note: US DOT data 2 times enplaned and 2 times loaded

The Pacific Northwest market is equivalent to 77% of the total Canadian Passenger Market and almost twice the total Canadian Cargo market. When Alberta is viewed as a single market within this regional context Table 5), it rivals the other major airports and actually

moves ahead of both Portland and Anchorage/Fairbanks in passenger demand. Presenting Alberta as a unified market breaks a psychological barrier regarding scale of demand. This will be an important theme in preparing a provincial air strategy.

Table 5

ALBERTA MARKET RELATIVE TO PACIFIC NORTHWEST AIRPORTS DEMAND (1992)

Airport Market	Passengers enplaned/deplaned
Seattle/Tacoma	16,710,022
Vancouver/Victoria	10,140,703
Calgary/Edmonton	**7,337,357**
Portland	7,000,846
Anchorage/Fairbanks	4,818,716

Combining Alberta demand creates the perception of a much stronger market. However, the importance of Alberta relative to other airports this should not be allowed to disguise the fact that over ten years in a dramatically increasing regional market, all Alberta airports have lost market share! This is graphically illustrated in Figures 2 and 3 on the following pages (data are enplaned/deplaned revenue passengers for Canada and two times enplaned passengers for the United States). While the Pacific Northwest passenger market increased by nearly 50% from 1983 to 1992, Alberta experienced a 5% relative loss in market share despite an absolute increase in passenger traffic. In short **Alberta's share of a growing regional market for international air transportation is shrinking.**

From 1983 to 1992, the Pacific Northwest air cargo market more than doubled while **Alberta airports experienced a combined 5% relative loss in air cargo market share** despite an absolute increase in air cargo volume. Note, however, that a major part of the regional air cargo increase is due to the establishment of Federal Express bases at both Portland and Anchorage.

FIGURE 2

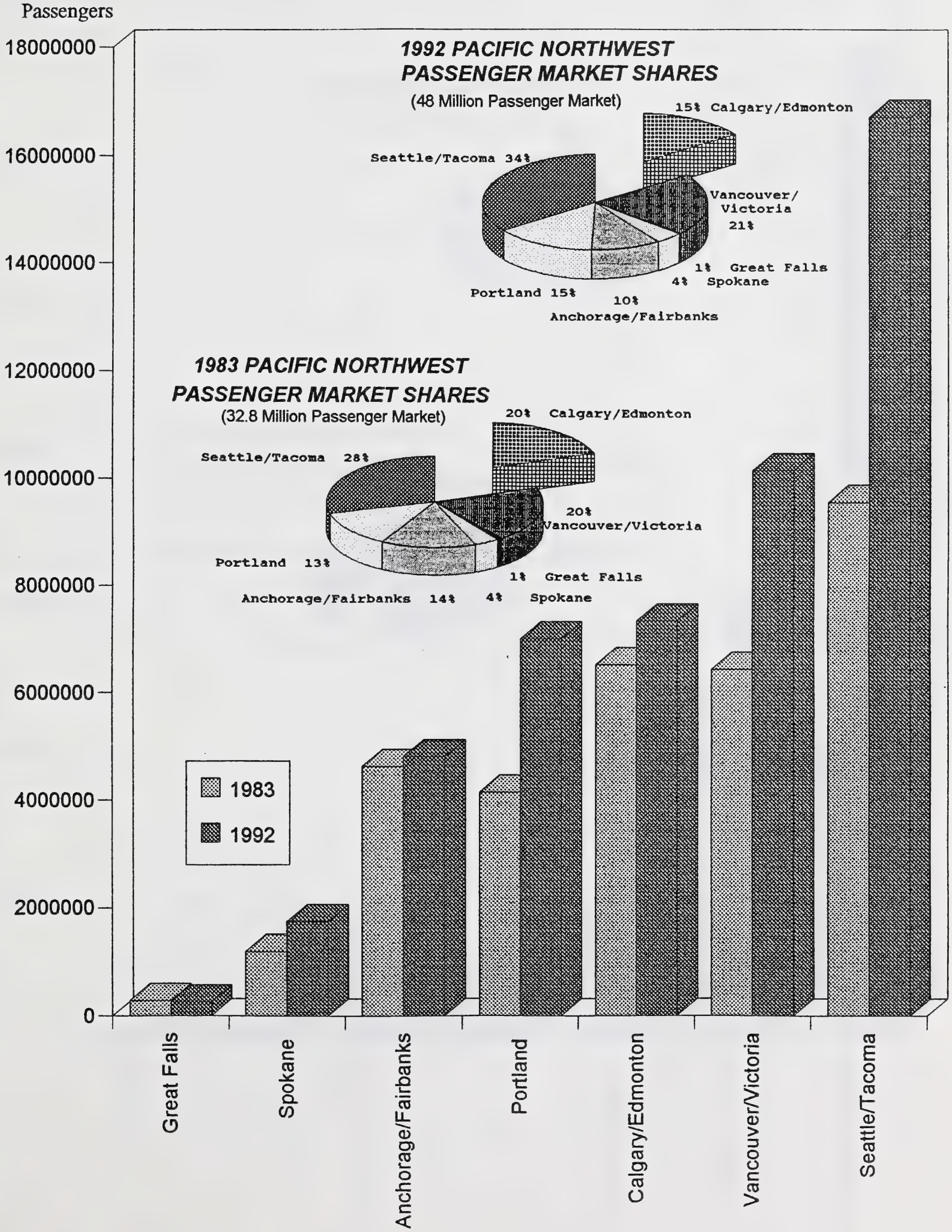
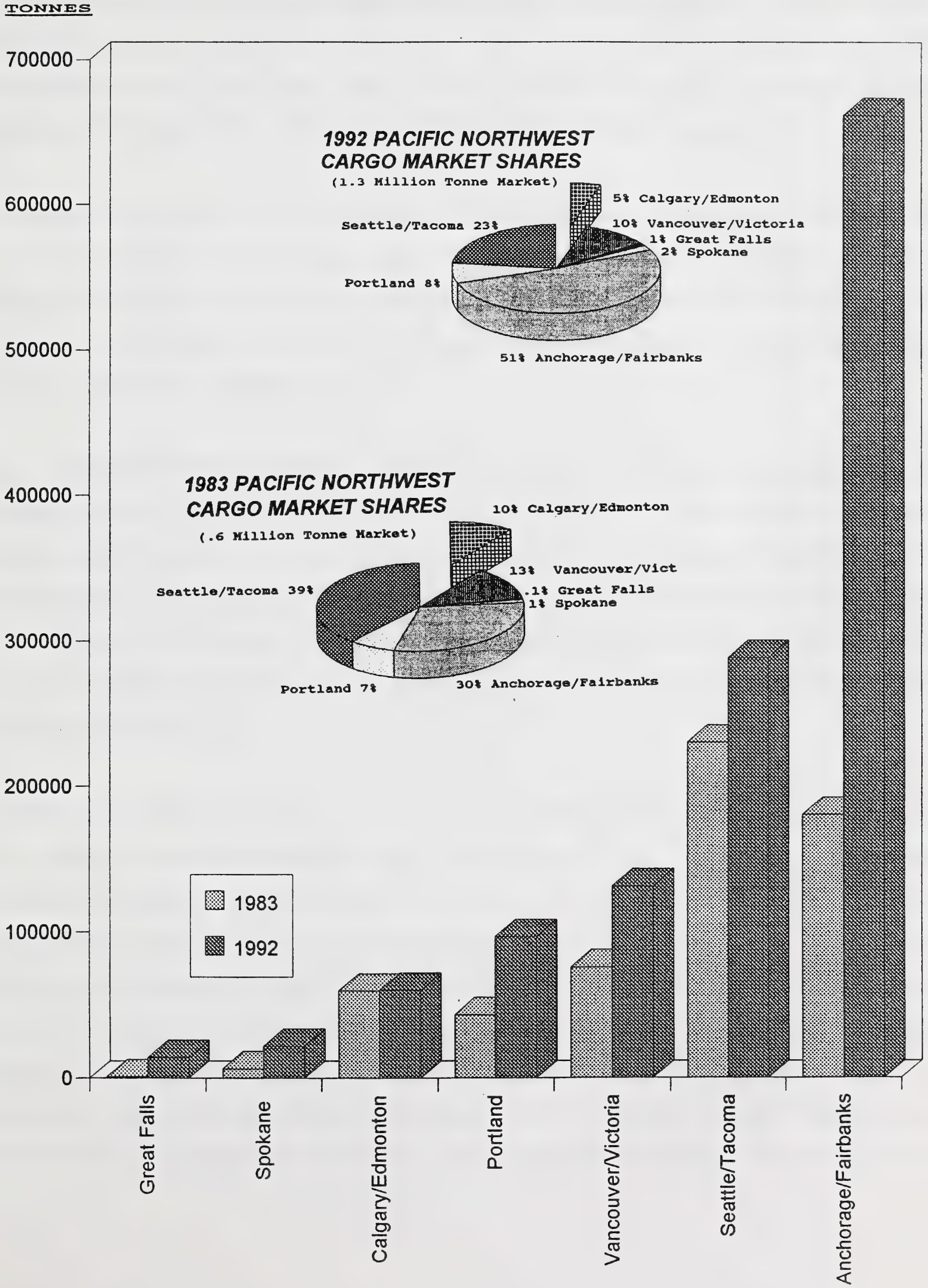

Passengers
18000000
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
1992 PACIFIC NORTHWEST PASSENGER MARKET SHARES
(48 Million Passenger Market)
15% Calgary/Edmonton
Seattle/Tacoma 34%
Vancouver/ Victoria 21%
1% Great Falls
4% Spokane
Portland 15%
10% Anchorage/Fairbanks
1983 PACIFIC NORTHWEST PASSENGER MARKET SHARES
(32.8 Million Passenger Market)
20% Calgary/Edmonton
Seattle/Tacoma 28%
20% Vancouver/Victoria
Portland 13%
1% Great Falls
Anchorage/Fairbanks 14%
4% Spokane
1983
1992
Great Falls
Spokane
Anchorage/Fairbanks
Portland
Calgary/Edmonton
Vancouver/Victoria
Seattle/Tacoma

FIGURE 3


TONNES
700000
600000
500000
400000
300000
200000
100000
0
1992 PACIFIC NORTHWEST CARGO MARKET SHARES
(1.3 Million Tonne Market)
5% Calgary/Edmonton
10% Vancouver/Victoria
1% Great Falls
2% Spokane
Seattle/Tacoma 23%
Portland 8%
51% Anchorage/Fairbanks
1983 PACIFIC NORTHWEST CARGO MARKET SHARES
(.6 Million Tonne Market)
10% Calgary/Edmonton
13% Vancouver/Vict
.1% Great Falls
1% Spokane
Seattle/Tacoma 39%
Portland 7%
30% Anchorage/Fairbanks
1983
1992
Great Falls
Spokane
Calgary/Edmonton
Portland
Vancouver/Victoria
Seattle/Tacoma
Anchorage/Fairbanks

More significantly, Alberta's air cargo volume is much smaller than any of the other major centres in proportion to passenger volumes. This is due to the lack of international carrier competition and/or wide body cargo capacity at Alberta airports. As a result, Alberta shippers truck cargo out of the province for on-going shipment by air.

As can be seen, the most dramatic growth in market share has occurred disproportionately at Seattle/Tacoma for passengers and at Anchorage/Fairbanks for cargo. Despite significant absolute traffic growth, relative passenger market share has not increased at Vancouver, Portland, Spokane or Great Falls (suggesting "leakage" from Alberta through these centres is not significant).

2.3 INTERNATIONAL MARKET. International demand has been the driving force for market growth at all Pacific Northwest airports (Figure 4). The most dynamic air service opportunities for Alberta airports are accordingly based on international traffic. Table 6 consolidates current enplaned and deplaned passengers and loaded and offloaded cargo volumes for the two international sectors, TRANSBORDER and OTHER INTERNATIONAL as well as DOMESTIC traffic. These traffic demand relationships are graphically displayed on Figures 5 and 6.

International passenger traffic accounts for almost 20% of Alberta demand - approximately 1.4 million passengers enplaned and deplaned per year. Of these, 1.1 million enplaned/deplaned passengers (80%) are transborder and 0.3 million (20%) are other international passengers (Figure 7). Other international passengers are those passengers enplaning and deplaning non-stop international flights at Alberta airports. The apparent demand for Alberta travel beyond the US is grossly understated to the extent that many Alberta passengers connect through gateways outside the province. Table 6 provides a composite view of Alberta travel beyond the US by including passengers who connect through other gateways because service is not available in Alberta. This is the market

segment where "leakage" is most significant.

FIGURE 4

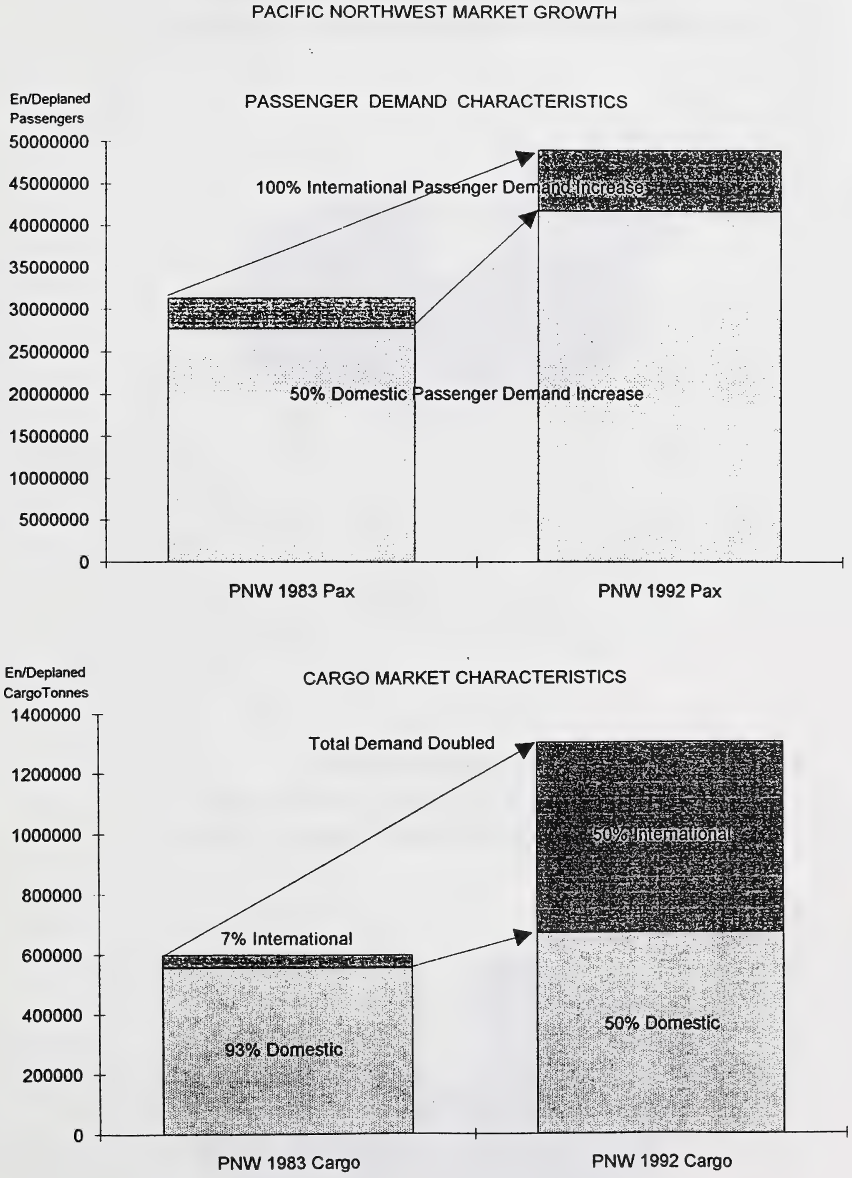


FIGURE 5

ALBERTA PASSENGERS
International Portion of Total Traffic
(1.5 Million Total International Passengers)

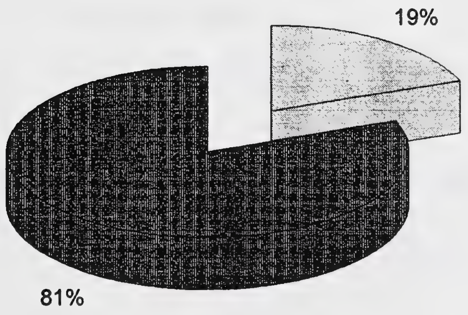
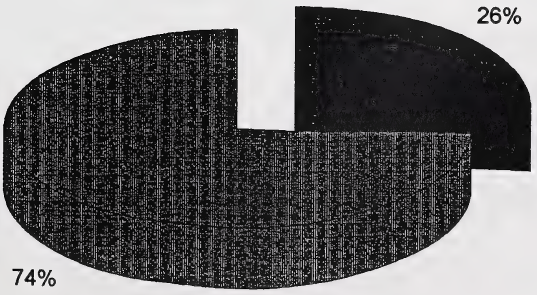


FIGURE 6

ALBERTA CARGO
International Portion Of Total Traffic
(15,600 Tonnes Total International Traffic)



Looking at demand for travel outside Canada and the US in this way shows that the Alberta market demand is nearly 700,000 passengers, two and a half times the current non-stop traffic volume from Alberta.

TABLE 6
ALBERTA AVIATION MARKET SUMMARY (1992)
enplaned/deplaned

	Passengers	Cargo (tonnes)
CALGARY		
Transborder	880,354	5,453
Other International	216,581	7,561
Total International	1,096,935	13,014
Plus Domestic	3,577,948	28,734
All Sectors Total	4,674,881	41,748
EDMONTON		
Transborder	256,837	921
Other International	63,943	1,666
Total International	320,780	2,587
Plus Domestic	2,341,696	16,153
All Sectors Total	2,662,476	18,740
ALL ALBERTA		
Transborder	1,137,191	6,374
Other International	280,524	9,227
Total International	1,417,715	15,601
Plus Domestic	5,919,642	44,887
All Sectors Total	7,337,357	60,488

Table 7
ALBERTA DEMAND FOR TRAVEL BEYOND the US (1992)

	Edmonton	Calgary	Total
Non-stop Flights To/From Alberta	63,943	216,581	280,524
Connecting Domestic Flights	127,680	211,270	338,950
Connecting US Transborder Flights	24,660	50,260	74,920
Total Alberta Demand	216,283	478,111	694,394

International cargo traffic accounts for approximately one quarter of Alberta demand - 15,600 tonnes per year (Figure 8). Transborder cargo volume is only 41% of the total international volume because trucking provides a competitive alternative.

FIGURE 7

ALBERTA TRANSBORDER VS. OTHER INTERNATIONAL PASSENGERS

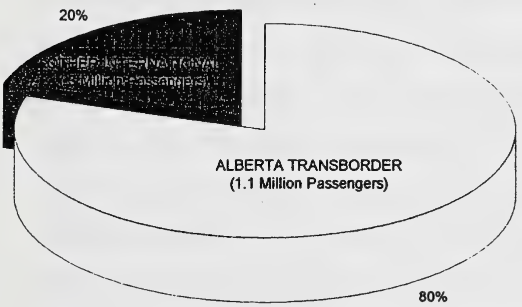
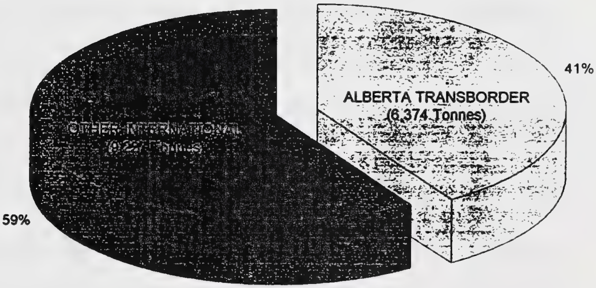


FIGURE 8

ALBERTA TRANSBORDER VS. OTHER INTERNATIONAL CARGO



2.4 ALBERTA MARKET LEAKAGE

A major market concern for Alberta airports is traffic diversion to airports outside the province. Air traffic leakage is:

- o **INTERNATIONAL TRAFFIC** between Alberta and points outside North America, accessed through Canadian or U.S. gateway airports outside Alberta;
- o **REGIONAL DOMESTIC TRAFFIC** which is diverted to surface transport (within an acceptable transit time) due to air service deficiencies or excessive rates;
- o **LONG HAUL DOMESTIC PASSENGER TRAFFIC** between Alberta and Eastern Canada shifting to U.S. airports to access cheaper US fares for trans-continental flight legs;

- **TRANSBORDER TRAFFIC** for which the transborder element is diverted to surface transport due to poor or costly transborder air service from Alberta resulting in an increase in traffic at U.S. airports.

"Leakage" is caused by inadequate volumes to support direct service or a combination of better service and/or lower rates. Service and rates are often functions of regulatory restrictions on transborder and international services. The primary concern with international service is diversion of traffic because direct service is not available in Alberta. Regulatory constraints limiting Alberta market entry by international carriers force both passengers and cargo to seek other gateway airports. This leakage does not necessarily decrease Alberta airport passenger activity as passengers may still use Alberta airports for domestic or transborder portions of international trips. However, Alberta airport activity is indirectly affected to the extent that poor gateway service decreases Alberta's market attraction and growth potential and also results in revenue losses at Alberta airports. For example, Alberta - Montreal service has declined and air traffic has (apparently) diminished between these points.

Modal shifts occur as the attraction of surface alternatives increases with rising regional air carrier rates. A current result of this modal leakage is the large scale diversion of Calgary/Edmonton and to a somewhat lesser extent Alberta/B.C. passenger traffic from air to automobile or bus. Modal shifts of transborder passengers are also a function of the relative cost of North American flights. Fluctuating exchange rates add an additional complication to this form of leakage. The current concern with transborder surface transport to access U.S. airports (e.g., Great Falls) may well reverse itself with prevailing exchange rates now favouring flights in Canada.

Market leakage of air cargo parallels passenger diversion. Intermodal leakages may occur due to the lack of main deck cargo capacity but may also be due to air cargo costs. Substantial truck leakage of international and transborder air cargo traffic from Alberta to Vancouver is a result of combi and freighter main deck capacity provided by Korean Air,

Singapore Airlines and Cathay Pacific together with expanded capacity due to increased international and domestic frequencies from other carriers. Similar advantages attract cargo to Seattle, Portland and Los Angeles on the west coast and Toronto and even New York on the east coast. Leakage typically occurs via road feeder services to international gateways where more carriers compete both on service and price. In general, these centres also provide main deck cargo capacity not otherwise available to and from Alberta (with the limited exception of KLM combi service to Amsterdam).

Freight forwarders indicate that a large amount of Alberta originating international air freight is diverted to alternate airports for lack of main deck capacity in Alberta. Although market leakage of live/bloodstock and outsized/heavy cargo traffic is reported by freight forwarders as a costly "haemorrhage" to other airports, we view this latent demand cautiously knowing that forwarders are willing to truck long distances as much to obtain more attractive rates as to access maindeck capacity. Some local freight forwarders truck freight for consolidation with their west coast or Toronto/Mirabel offices to achieve higher break points and thus lower rates. Reversing the road freight service (RFS) leakage will require additional international main deck cargo lift at Alberta.

3. SERVICE ANALYSIS

Air transportation service in Alberta is provided at three levels:

- major scheduled airlines,
- alternative charter/low cost carriers, and
- dedicated courier/cargo carriers.

3.1 MAJOR SCHEDULED PASSENGER SERVICE

Scheduled airline services in Alberta are provided by the two Canadian flag carriers, several U.S. transborder carriers and KLM Royal Dutch Airlines:

CANADIAN AIRLINES operations in Alberta include domestic and regional services. Transborder service includes the U.S. west coast over Vancouver and a non-stop seasonal operation to Hawaii. **Canadian has no scheduled authority between Alberta and the continental U.S., forcing the carrier to move any U.S. origin or destination traffic through its other Canadian gateways.** International service includes Trans-Atlantic non-stop flights to London, Amsterdam, and Frankfurt. Trans-Pacific service is limited to a weekly non-stop flight to Tokyo with all other service connecting over Vancouver.

AIR CANADA operations in Alberta include extensive domestic and regional (Air B.C.) service. Transborder service is direct to San Francisco and Los Angeles and seasonally to Chicago and New York. International service is non-stop to London and over Toronto to other European destinations.

DELTA AIRLINES provides the most extensive U.S. transborder service with multiple connections over its Salt Lake City hub as well as non stop service to Denver.

UNITED AIRLINES provides connections over Spokane to Seattle and San Francisco with direct service to Chicago.

AMERICAN AIRLINES provides non-stop service to its major Dallas-Fort Worth hub with on-going service to Houston.

NORTHWEST AIRLINES provides non-stop service to the Minneapolis-St. Paul hub with multiple connections to US mid-west and east coast destinations.

KLM ROYAL DUTCH AIRLINES provides non-stop B747-Combi service Vancouver - Alberta - Amsterdam.

LUFTHANSA GERMAN AIRLINES provides non-stop service to Frankfurt on Canadian Airlines in a traffic sharing arrangement.

3.1.1 DOMESTIC and TRANSBORDER TRAFFIC. While Alberta is well served domestically, regulatory restrictions preclude direct service to a number of U.S. cities that the market would otherwise justify.

Table 8
TRANS-BORDER SCHEDULED SERVICE DEMAND FROM CALGARY/EDMONTON

	ORIGIN-DESTINATION DEMAND			SEAT CAPACITY
MARKET	CALGARY	EDMONTON	TOTAL	NON STOP SERVICE
Atlanta	10,080	4,780	14,860	None
Boston	12,500	6,470	18,970	None
Chicago	26,640	10,400	37,040	24,934 Seasonal
Dallas/Ft Worth	23,770	8,270	32,040	155,064
Denver	20,510	5,450	25,960	54,600
Detroit	3,100	6,080	9,180	None
Hawaii	21,400	18,100	39,500	44,668 (1)
Houston	33,740	9,290	43,030	via DFW
Las Vegas	21,160	19,950	41,110	None (2)
Los Angeles	126,650	60,180	186,830	104,468 (3)
Miami	14,200	13,150	27,350	None
Minneapolis	7,990	11,220	19,210	100,464
New York	33,270	14,510	47,780	24,934 Seasonal
New Orleans	6,620	3,410	10,030	None
Orlando	10,750	13,780	24,530	None
Philadelphia	5,260	3,430	8,690	None
Phoenix	33,900	23,960	57,860	None (4)
Portland	5,080	2,760	7,840	None
Reno	2,480	2,020	4,500	None
Salt Lake City	14,930	5,810	20,740	314,496
San Diego	8,780	5,160	13,940	None
San Francisco	57,860	23,390	81,250	49,868
Seattle/Tacoma	18,190	6,500	24,690	None
Spokane	11,540	1,400	12,940	109,200
Tampa/St Petersburg	10,160	8,050	18,210	None
Washington/Balt.	11,870	6,840	18,710	None

Notes:
1. Hawaii charter service provides 85,000 add'l seats.
2. 57,608 charter seats offered to Las Vegas.
3. Additional direct service available via SLC.
4. 16,000 charter seats offered to Phoenix.

Source: Stats Can Cat 51-204 Table 4 (1992) and Dalcor/Prolog

Table 8 indicates the balance between current direct service and demand for major transborder markets. It is apparent, especially when viewed on an aggregate Alberta basis, that current service levels do not match demands except for a few limited markets.

3.1.2 INTERNATIONAL GATEWAY TRAFFIC. Alberta is reasonably well served as a Trans-Atlantic gateway to Europe. However, scheduled service as a Trans-Pacific gateway is negligible and to Latin America non-existent. Existing international non-stop services move 280,524 passengers on a non-stop basis between Alberta and points outside North America. This is about 40 percent of the total Alberta demand for international services.

Table 9 indicates the full Alberta demand for Trans-Atlantic, Trans-Pacific and Latin American air travel to and from Alberta including passengers travelling through other Canadian and U.S. gateways. Several general conceptual conclusions can be drawn:

- There is substantial "leakage" from Alberta to other Canadian (339,000) and United States (75,000) gateways;
- There is a substantially greater market for travel outside Canada and the US than indicated by Alberta passenger traffic statistics alone; and
- Alberta warrants substantial additional international service, especially for Trans-Pacific and Latin American travel.

Alberta achieves an apparent load factor of 75% on transborder and international services. Given the peaking effects usually anticipated on such flights, it would appear that Alberta could readily support additional services. This clearly shown on Figure 9.

FIGURE 9

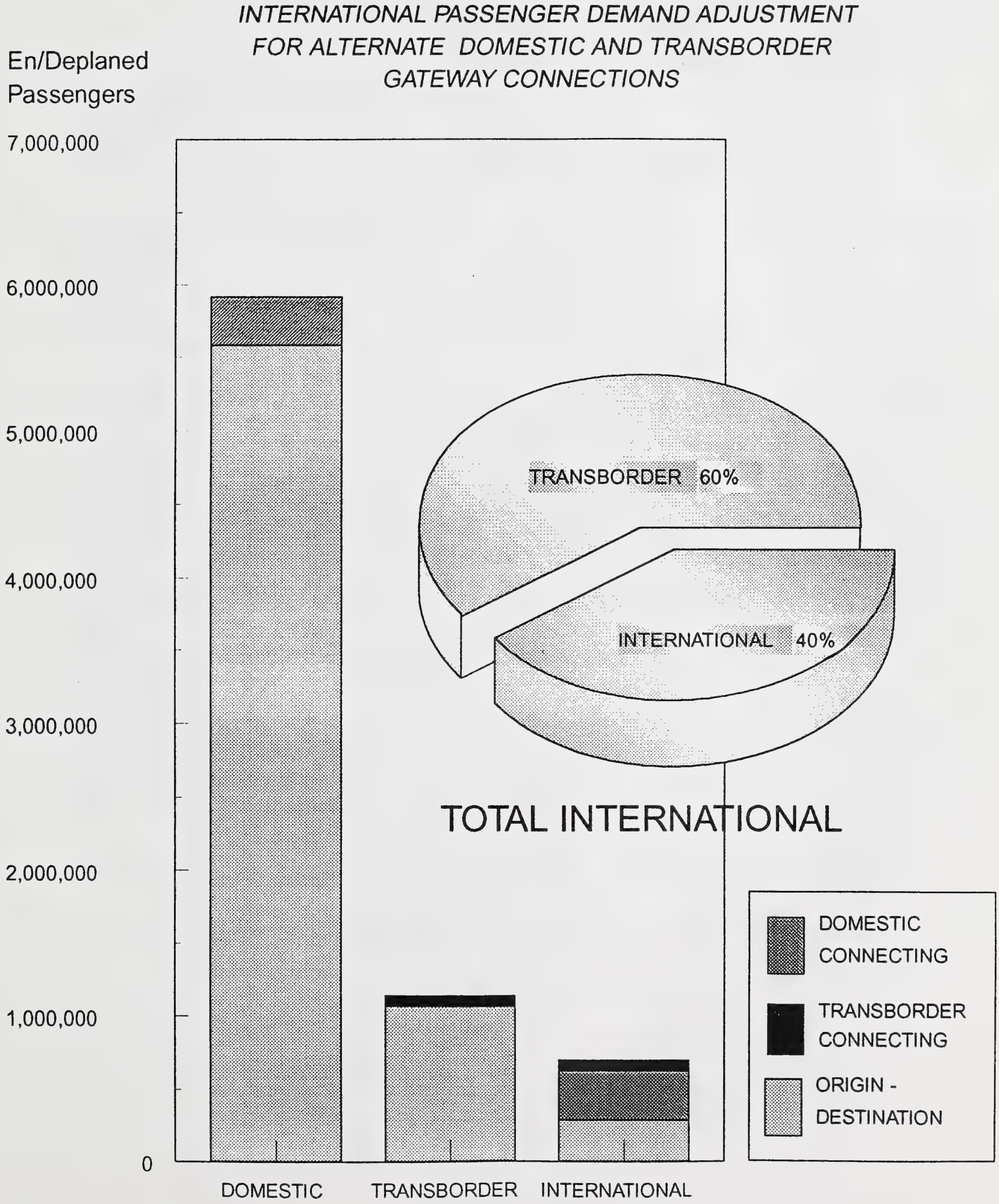

INTERNATIONAL PASSENGER DEMAND ADJUSTMENT FOR ALTERNATE DOMESTIC AND TRANSBORDER GATEWAY CONNECTIONS
En/Deplaned Passengers
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
TRANSBORDER 60%
INTERNATIONAL 40%
TOTAL INTERNATIONAL
DOMESTIC CONNECTING
TRANSBORDER CONNECTING
ORIGIN - DESTINATION
DOMESTIC
TRANSBORDER
INTERNATIONAL

Table 9

ALBERTA's INTERNATIONAL SERVICE DEFICIENCY (1992)

	TRANS-ATLANTIC	TRANS-PACIFIC	LATIN AMERICA	
Alberta Gateway Flights				
Calgary	216,581			
Edmonton	63,943	10,500		
Total Alberta	280,524	10,500		
Canadian Gateway Diversions				338,950
Halifax	810			
Montreal	7,480			
Ottawa	2,080			
Toronto	152,340			
Vancouver		176,240		
U.S. Gateway Diversions				74,910
Atlanta	1,360			
Boston	310			
Chicago	1,860			
Dallas/Ft Worth			7,380	
Detroit	330			
Hawaii		7,760		
Houston			350	
Los Angeles		18,040	18,040	
Miami			5,960	
Minneapolis	1,300			
New York	2,030			
San Francisco		3,020	3,020	
Puerto Rico			2,070	
Tampa/St Petersburg			260	
Seattle/Tacoma		1,000		
Washington/Baltimore	820			
Total Demand	451,244	206,060	37,080	
Seats to/from Alta	371,488	13,624	None	

Source: Statistics Canada Catalogue 51-204 Table 8 (1992) and Dalcor/Prolog estimates.

3.2 ALTERNATIVE PASSENGER CARRIER SERVICE.

Alternative charter/low cost carriers provide a wide range of services to domestic and international destinations.

AEROMEXICO provides "scheduled" charter service to Mexico.

MARTINAIR provides holiday charters to Amsterdam.

CANADA 3000 provides both holiday charters and limited domestic "scheduled" charter service across Canada.

CORP AIR provides project support flights and regular crew rotation and resupply services to Northern Russia.

ADVANCE AIR CHARTER provides project charters and regular crew rotation and resupply services to Western Siberia.

AIR TRANSIT provides "scheduled" charter service to Montreal and Toronto.

ROYAL AIRLINES provides non-stop service to Toronto.

AIR CLUB INTERNATIONAL provides non-stop flights to Frankfurt.

LOT POLISH AIRLINES provides service to Poland.

3.2.1 LONG HAUL CHARTER SERVICE. Charter operators such as Wardair played a significant role in the development of Canadian air services. In Canada, they traditionally provide a relatively high quality service standard. This trend continues today. However, the industry adjustment which occurred in the Canadian air carrier industry during the 1980's saw the demise of several long term charter operators. During recent years, new operators have arisen who now provide a large number of seats for both long haul domestic and international service from Alberta. This is summarized on Table 10. Note that annual data are not provided as service varies significantly year over year.

TABLE 10

Weekly Seats Available ex Alberta (Summer 94)

	TOTAL	DOMESTIC	TRNSBRDR	INTL
Calgary	9103	4132	3343	1627
Edmonton	3613	2575		1038

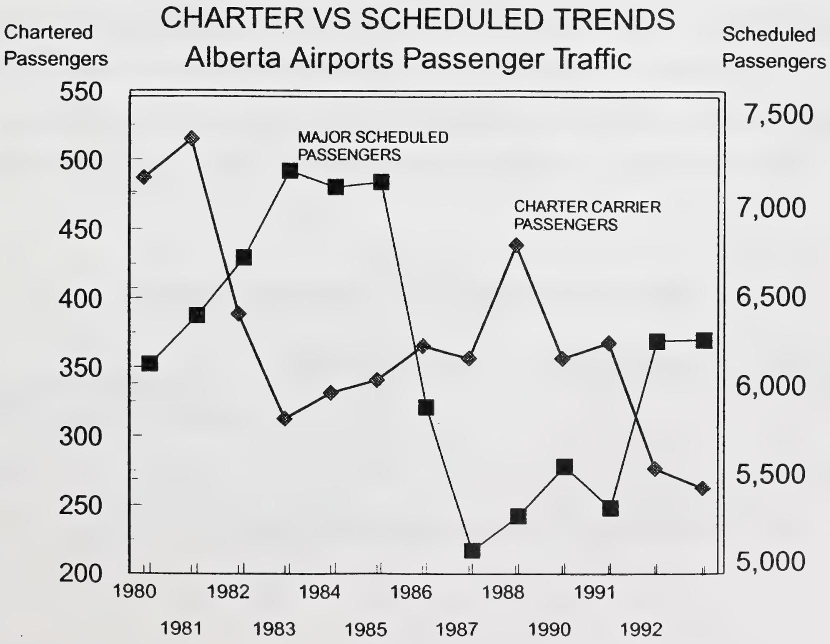
Estimated Semi-Annual Charter Seats Available ex Alberta

	TOTAL	DOMESTIC	TRNSBRDR	INTL
Calgary	236676	107439	86926	42312
Edmonton	93938	66950		26988
Total AB	330614	174389	86926	69300

Source: Calgary and Edmonton Airport Authorities

Charter operations provide the only competitive check on the Canadian scheduled service duopoly. However, most charter carriers also aspire to become scheduled carriers. Over the past fifteen years, a recurring pattern of charter service activity has emerged that appears to characterize the industry life cycle. Figure 10 shows the inverse relationship between charter and scheduled service.

FIGURE 10



As charter carriers increase traffic share by moving into scheduled service markets, they become increasingly susceptible to pre-emptive action by the major scheduled carriers. The major carriers typically recapture traffic through aggressive pricing (seat sales) or, in the extreme, through merger and acquisition (Wardair).

3.2.2 SHORT-HAUL, LOW-COST SERVICE. In the United States, Southwest Airlines has succeeded in stimulating latent traffic demand as well as diverting hub and spoke traffic from the major carriers. The Southwest strategy is to enter high density markets with frequent, no-frills service offered at fare levels based upon a streamlined cost structure that the major airlines cannot yet match. Key to this strategy is avoiding the high cost of hubs feeding long haul flights with regional connectors. Instead, Southwest concentrates on shorter haul service between city pairs and offers no on-line connections. The "Southwest Effect" is a powerful competitive force causing US carriers to restructure service. It will inevitably impact service competition in Canada as well.

Calgary and Edmonton are two of three points of a short-haul, high density air traffic triangle with Vancouver. At present, scheduled service is provided primarily by Air Canada and Canadian Airlines or their affiliates as shown on Table 11. Fares are very high, setting the stage for a low cost operator modelled along the lines of a Southwest to enter the market. One can expect Canadian Airlines to re-enter the Western Triangle market with a low cost service in response to any competitive initiative by another carrier.

Table 11
Calgary - Edmonton - Vancouver Service (1994)

	Flights/week	Seats/week	In/out
Calgary/Vancouver	153	16,406	32,812
Edmonton/Vancouver	97	8,351	16,702
TOTAL	250	24,757	49,514

Source: Air Carrier Schedules with analysis by Dalcor/Prolog

3.3 ALBERTA AIR CARGO SERVICE.

Air cargo service in Alberta has two major elements. JOINT PRODUCTION CARGO SERVICE has replaced scheduled air freighter service and is increasingly oriented toward ULD capable widebody belly capacity and to a limited extent main deck combi capacity (KLM). ALL-CARGO AIRCRAFT SERVICE is increasingly oriented toward dedicated overnight courier operations supplemented by infrequent freighter operations on a charter basis.

Dedicated Courier/Cargo Services offered to Alberta include:

EMERY WORLDWIDE serves Alberta with Convair flights connecting at Seattle from its primary hub in Dayton, Ohio.

PUROLATOR COURIER uses two B727s operated by Kelowna Flight Craft to provide domestic nightlift capacity (with connecting service between Edmonton Municipal and Calgary).

AIRBORNE EXPRESS shares transborder space with Purolator on dedicated nightlift operated with Falcon 20 jet equipment between Alberta and the Airborne hub in Wilmington, Ohio.

FEDERAL EXPRESS provides transborder service from Memphis to Alberta via Great Falls, Montana using a B727 aircraft.

FEDERAL EXPRESS provides domestic service consisting of B727 aircraft operating between Toronto, Winnipeg and Vancouver through Alberta in each direction. Feeder service is with Metros.

3.3.1 ALL-CARGO AIRCRAFT SERVICE. With the recent termination of scheduled Cargolux service, the only all cargo aircraft capability regularly available in Alberta is dedicated to overnight courier traffic. Cargolux offered all cargo 747 service through Alberta for several years. This service was based to some extent on a technical stop requirement for early version 747 aircraft but also provided Cargolux with access to outsize cargo originating in Alberta. Service was recently terminated primarily because oversize

cargo demands do not provide a steady cargo market base.

A significant and growing dedicated nightlift capability is provided by the couriers themselves. Alberta courier express operations serve as a Western Gateway connecting competing courier "spokes" with their major hubs in the United States.

It is unlikely that Alberta will play a significant role as an international/intercontinental hub for overnight courier express cargo during the near term. To the extent that Canada's linear courier routes require hubbing, Winnipeg's location (due to geography and time zone) is more strategic than Calgary, Edmonton or Vancouver. Winnipeg is already a national hub (transfer point) for Air Canada's transcontinental courier express services. Alberta is simply too far west to be a hub for a transcontinental system. Alberta could be a reasonable location for North America/Asia or North America/Europe routes but not for intercontinental connections between Europe and Asia as Alberta is too far south of the great circle route, at least until it can contribute large amounts of cargo traffic not available at Anchorage.

The demand for main deck cargo capacity at Alberta certainly exceeds the charter freighter traffic volume indicated by airport statistics. A common criticism by international freight forwarders is that Alberta demand warrants more regular main deck air freight capacity from all-cargo charter/freighter/combi airlines. However, freight forwarders truck long distances as much to obtain more attractive rates as to access maindeck capacity.

All-cargo freighters are sometimes chartered to obtain main deck capability not available in the belly of joint production aircraft. Such service in Alberta is almost exclusively related to over-sized oilfield shipments or livestock traffic.

Regulations limit non-scheduled charter freighter operations in Canada to single entity charters. Canada's National Transportation Act makes a clear regulatory distinction

between scheduled and charter services for shipments originating in Canada. The intent is to protect Canadian cargo carriage for Canadian carriers. While scheduled joint production cargo services can be sold to third parties at unit toll rates, charter cargo services, with few exceptions (eg. livestock and courier shipments) must be sold to only one user and capacity cannot be resold to others eliminating the split charter. These provisions significantly limit the potential for growth of the freight forwarding industry in Alberta. However, Alberta's charter freight capability would seem to be enhanced by one of the few exceptions to the single entity requirement - split charters are allowed for livestock. Alberta is ideally positioned in horse and cattle country so this exception provide a valuable opportunity as international demand for live/bloodstock increases.

The ability to receive inbound international charter freight is generally not affected by Canada's single entity restriction. Inbound shipments are usually allowed according to regulations of the country-of-origin.

3.3.2 JOINT PRODUCTION CARGO SERVICE. In the AIRLINE FREIGHT market, most cargo is handled by joint production of both passenger and cargo service in the same aircraft. This includes belly cargo in narrow-bodied aircraft, ULD (unit load device) belly containers in wide-bodied aircraft and maindeck combi cargo capacity shared with passengers.

Joint production cargo lift capability is provided by the major scheduled carriers in Alberta: Air Canada, Canadian Airlines, United Airlines, Northwest Airlines, Delta Airlines, American Airlines, and KLM Royal Dutch Airlines currently provide service to Alberta.

Joint production service is focused primarily on passengers, not cargo. Strong and increasing passenger demand has created surplus air cargo capacity in Alberta on most routes. Trans-Atlantic service shows substantial excess of outbound over inbound cargo movements consistent with the strong demand for eastbound sea/air and horsemeat

capacity to Europe. The transborder market shows a great imbalance of inbound over outbound cargo.

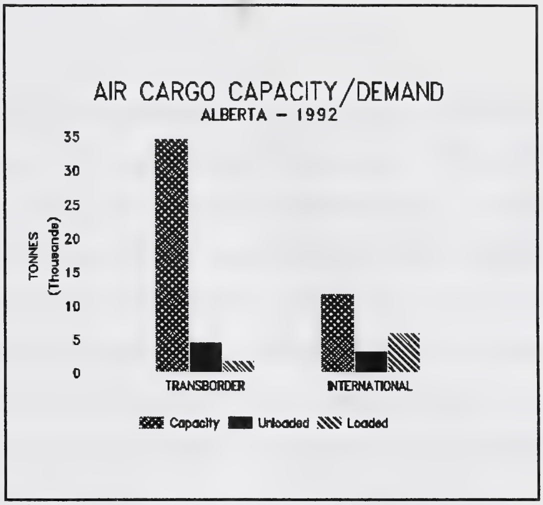
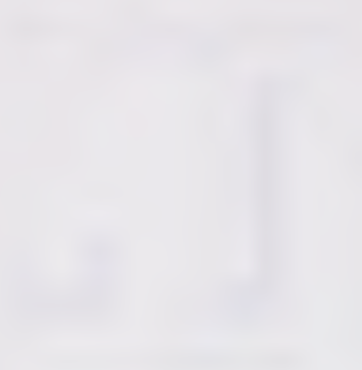


Figure 11

Figure 11 highlights Trans-Atlantic and Transborder cargo backhaul capacity. There may be an opportunity to expand Alberta service beyond that required to meet local demand. Ever changing traffic balances present a strategic opportunity to fill excess capacity from Alberta with incentive backhaul rates. Alberta could provide international bridging capability to make a market for this excess capacity. However, such service opportunities are elusive and require close monitoring of changing traffic flows.

Air cargo is not necessarily tied to the closest airport. No airport has a monopoly on its air cargo and airports compete in an overlapping marketplace. Alberta could conceivably offer a more attractive cost and service package for particular segments of the air cargo markets currently handled at other airports. However, the type of capacity available at Alberta is not always compatible with the demands of shippers. Heavy/oversized oilfield equipment and process modules custom fabricated in Alberta frequently cannot fit through the cargo door or may exceed the safe limit permitted for manual loading of joint-production aircraft.

Narrow bodied passenger aircraft generally lack capacity for unit load devices (ULDs e.g., containers and main deck pallets), severely limiting interlining opportunities to transfer cargo over intermediate points. Although Alberta is served by several ULD capable wide-body aircraft on domestic routes, most transborder flights are still flown by narrow-bodied



passenger equipment.

Adding international air cargo capability requires new bilateral air agreements. Bilateral negotiations extend over long periods of time. It is unlikely the Government of Canada will allow new international competition in Alberta without equivalent access to foreign markets for Canadian carriers. However, a number of routes already authorized to foreign carriers are not currently operated. These include links between Alberta and Australia, Barbados, India, Japan, Germany, Luxembourg, Mexico, the Netherlands, the United Kingdom and the United States. There is also the potential for Alberta points to be designated by carriers of Australia, Brazil, China, Hong Kong and Jamaica. Although this might entail a redesignation from a previously selected point, it would not require new negotiations. Canadian carriers can generally serve non-Canadian destinations from any Canadian point.

4. SCENARIO DEMAND

A key element of this study is a set of scenarios which may result in increased passenger and air cargo activity to or through Alberta. A scenario approach allows consideration of events and market potential not readily identified through trend forecasting. With scenarios, one can consider how specific economic developments may act as building blocks for additional aviation activity.

Some, all or none of the proposed scenarios may take place. The scenario approach is provided as a flexible forecasting tool for the reader. Scenarios are presented to stimulate discussion and may be adjusted to reflect differing interpretations of their validity and impact on demand for aviation services.

Two types of scenario have been considered. The first involves events which develop through entrepreneurial activity external to the airports, but which will, if they occur, create demands for origin and destination air services in Alberta. Alberta airports must react to such activities if and when they occur. The second type of scenario involves value-added activities for which the Alberta airports themselves act as the economic activity generator. These in-transit situations are not Alberta destination dependent but will increase aviation traffic through Alberta airports.

We have not identified or developed estimates of capital projects which may occur from time to time in Western Canada. Investors will generate such estimates when planning for projects and will then approach air facilities to help meet their needs. Scenarios proposed are based on business opportunities which will generate a sustained on-going demand for air services.

4.1 ASIA PACIFIC SPINOFFS. Asian relationships with Canada are increasing as are Canadian merchandise exports to Asia. As these global linkages strengthen and as the ethnic population base in Western Canada grows, additional air transportation opportunities will arise.

The Canada West Foundation expects Asian markets to grow from $5 trillion in 1990 to over 7 trillion by 2000, an increase of more than 40 percent. Assuming our tourism and business travel increases at the same rate, the current 206,000 passenger volume would increase by 85,000 to nearly 300,000 per annum. Increasing our share of Asian investment by encouraging additional spin-off in Alberta would expand this level of activity. Current Alberta non-stop service provides 13,624 seats.

4.2 ROCKY MOUNTAIN TOURISM. It should be possible to dramatically increase air travel by cruise ship passengers by including the Canadian Rockies before or after Alaska Cruise Ship passage at Vancouver. Tourism Vancouver is currently working with Alberta tourist promotion agencies to make this happen.

The strategy is to promote the Canadian Rockies to keep tourists for one or two days in Western Canada rather than bussing them directly to their cruise ship from Seattle/Tacoma as presently occurs. The tactic is to capitalize on open-jaw fare opportunities to have cruise ship passengers fly into an Alberta airport and out of Vancouver - or vice versa. Between Alberta and Vancouver an array of Rocky Mountain Tourist opportunities is being promoted including motor home travel, tour bus travel, and tour train travel (the Rocky Mountaineer from Calgary and Jasper and VIA train connections from Edmonton).

The magnitude of demand under this scenario is a function of the booming cruise ship business at Vancouver which now exceeds 500,000 passengers on and off the vessels each summer and is growing by 10% per year - 274 sailings are booked in 1994 and 300 are

booked in 1995. Assuming a reasonable capture rate target of 20%, the potential Alberta aviation demand associated with this scenario is 100,000 passengers per year.

4.3 ETHNIC POPULATION TRAVEL. World events are increasing the opportunity to travel in Eastern Europe and Asia. Communist control previously precluded most travel by Canadians. Alberta has a large population from these regions desiring to return to visit friends and relations - or to conduct business. These total 250,000 as shown on Table 12 (not including 7,170 South Americans).

Table 12
ETHNIC ORIGIN POPULATION IN ALBERTA
(as declared in the 1991 Census)

EASTERN EUROPE		ASIA PACIFIC		TOTAL
Ukrainian	104,350	Chinese	71,635	
Polish	32,840	Vietnamese	13,250	
Hungarian	12,100			
Czech/Slovak	8,460			
Balkans	7,520			
	165,270		84,885	250,155

Source: 1991 Census

Statistic Canada data on trips by resident and non-resident travellers were reviewed and compared to the "ethnic" population base in Canada to calculate a travel propensity ratio (see Appendix B). This ratio increased from 0.117 trips per capita in 1981 to 0.182 trips per capita in 1991 or approximately one trip every five years. If this level is achieved by eastern European, Chinese and Vietnamese origin Albertans, about 50,000 trips or 100,000 enplaned/deplaned passengers per annum would occur.

4.4 NAFTA/FTA IMPACTS. Trying to sort out what will happen to trade between Canada, the US and Mexico under the NAFTA is difficult. The effects of the Canada/US Free Trade Agreement are now largely in place and might be a useful proxy. However, the FTA and the NAFTA are very different agreements.

Under the FTA, Western Canadian exports to the US, excluding grain, increased by 23% during the five year period 1988 to 1993 with Alberta showing the strongest growth (77% over five years)[1]. The largest dollar increases in exports from Alberta were coal, crude oil and natural gas. These sectors have limited effects on air travel. Large percentage increases also occurred in meat and meat products, machinery, telecommunication machinery and equipment, instrumentation and furniture, all products with larger air service impacts.

Transborder air travel from Alberta and British Columbia for the period 1989 to 1992 increased by 18.3%. It is believed that the slowdown in growth from the 1983 to 1989 period was primarily due to reduced tourist travel. However, changing patterns of business travel may also have had an influence.

Canadian two-way trade with Mexico is currently quite small ($3.5 billion in 1992). Of this amount, Canadian exports were $771 million. We estimate two way business travel between Alberta/BC and Mexico in 1992 was 10,081 passengers. This is growing rapidly as Canadian companies seek to position themselves for new opportunities. Those of most significance to Alberta are in oil and gas, engineering, agricultural and forest products, mining equipment and services, chemicals, metals and industrial machinery and telecommunications equipment.

Developing economies often show very high growth rates of 7% or more per annum. A doubling of real GDP in Mexico over ten years is realistic. Assuming trade between Alberta and Mexico increases at the same rate, business related air travel would increase by 10,000 enplaned/deplaned to 20,000 plus passengers per annum by 2002.

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[1] **"Alberta, Western Canada and the Free Trade Agreement 1988-93"**, Edward J. Chambers and S. Stephen Janzen, Centre for International Business Studies, Faculty of Business, University of Alberta, April 1994.

The opportunity for Alberta to develop direct air service to Mexico is enhanced by the availability of unused authorities within existing bilateral agreements between Mexico and Canada. Routings available from Alberta are:

From:	To:
Calgary, Edmonton	Guadalajara Mexico City Acapulco
Calgary	La Paz San Jose del Cabo Mazatlan Puerto Vallarta

4.5 **NORTHERN MINERALS DEVELOPMENT.** Northern mineral developments generate significant aviation activity for crew rotations, maintenance activities and general support services. There is an excellent prospect that gold and/or diamond mines will be developed in the Northwest Territories within the next few years. Diamet seems close to a full scale diamond development modelled on Lupin and supported by Hercules and 727/737 service. After construction is complete, a normal servicing operation will be implemented. Experience with the Lupin project offers a proxy for the potential impact associated with new mineral developments.

Lupin is supported by air using a 727 aircraft operated by Corp Air out of Edmonton International. This aircraft runs a "scheduled service" as set out below:

Flights per week	3
Enplaned/Deplaned pax/wk	380
Loaded/Offloaded cargo/wk	85,000 lbs.
Annual pax enplaned/deplaned	19,760
Annual cargo (tonnes)	2,000

4.6 FORMER SOVIET UNION **RESOURCE DEVELOPMENTS.** Resource mega-projects in Alberta during the 1980's developed a large pool of technical and management expertise which is being repositioned to support oil and gas resource development in other parts of

the world including the former Soviet Union. This has significant implications for international passenger and cargo market development. It includes "hard" transportation requirements for crew rotation, camp supply and equipment delivery as well as "soft" transportation demand associated with ongoing technology transfer. Alberta's involvement is directly through Canadian resource development companies with projects in Russia and indirectly through Canadian contractors and suppliers to other North American companies with projects in Russia.

The demand for crew rotation and cargo capacity to support Russian resource development has already resulted in two dedicated air logistics operations based in Alberta. Corp Air supports Gulf Canada's Russian project from Edmonton with two 727 combi flights per month to the Komi Arctic region. Advance Air Charter supports Beta Well Services and Canadian Fracmaster from Calgary with several DC8 combi fights per month to Western Siberia. In the longer term, a strategy for Alberta may be to build air service capacity to and through Moscow as well as direct to resource development project locations in the Former Soviet Union.

Detailed development of scenario traffic related to resource development projects in the former Soviet Union is provided in Appendix C and summarized in Table 13.

TABLE 13
FORMER SOVIET UNION RESOURCE DEVELOPMENT AIR SERVICE DEMANDS

	BASE	SHARE	FORECAST	
EN/DEPLANED PASSENGERS				
North American Projects	153,400	50%	76,700	
Canadian Projects	7,878	100%	7,878	
				84,578 pax.
EN/DEPLANED CARGO TONNES				
North American Projects	45,000	50%	22,500	
Canadian Projects	1,500	100%	1,500	
				24,000 tonnes

Construction employment for capital investment was assessed using the Construction Simulation Model developed by DALCOR for projects which have Canadian owners or are

being completed by Canadian contractors. Employment for drilling and production were estimated using factors developed by the Energy Services Association who estimates that it requires one third of a person year to drill and place one well on production. Overall, we anticipate 2,018 person years of employment for each billion dollars (US) of capital investment in development and production and 3,460 person years of employment for each billion dollars (US) of pipeline construction.

The estimated average annual investment for Major Production Projects is $2 billion/year requiring a work force 4,026. For Major Pipeline Projects it is $4 billion/year requiring a work force of 13,840. Assuming that approximately one third of workforce personnel will be sourced from North America, that rotation will require an equal number of work force counterparts, and that these personnel are effectively rotated 13 times per year (allowing for seasonal and other effects), this would generate 153,400 enplaned and deplaned passengers at North American airports. A 50% Alberta share is assigned to this traffic both because many of the oilfield workers may be contracted from Alberta and because of the existing capability to provide attractive connections in Alberta for Texas based contractors to travel directly to field locations in the former Soviet Union.

We have also developed scenarios for exclusively Canadian Projects underway or planned for start-up before the year 2000. The estimated average annual investment for these projects is $200 million/year. These are primarily enhanced oil recovery projects awarded to Canadian Service Contractors and we have assumed a drilling employment factor of 2 persons for each million dollars of expenditure. We have assumed 75% Canadian content due to the technical nature of such specialized contracts. Rotation will require an equal number of work force counterparts and these personnel are effectively rotated 13 times per year (allowing for seasonal and other effects) generating 7,878 enplaned and deplaned passengers all at Alberta airports.

The air cargo forecast associated with this scenario is based on current Alberta based

support of Russian projects which generate approximately 5 tonnes per $1 million expenditure, plus a 50% retrograde allowance. Again it is assumed that Alberta can capture 50% of North American based project traffic and 100% of Canadian based project traffic.

4.7 **SOUTHWEST EFFECT.** The typical "Southwest Effect" in a relatively high-priced, short-haul, high density market is to reduce average fare levels by 30% and to increase traffic by 60%. The traffic gain results from lower fares stimulating new price elastic traffic. A Southwest Effect Scenario holds the prospect of generating abnormal passenger traffic increases at Alberta airports as shown on Table 14.

Table 14

SOUTHWEST EFFECT SCENARIO
(Alberta Enplaned Plus Deplaned Passengers)

	Calgary	Edmonton	Total
Calgary-Edmonton Corridor	246,450	246,450	
Edmonton-Vancouver Corridor		296,250	
Calgary-Vancouver Corridor	402,790		
High-Density/Short Haul Markets	649,240	542,700	1,191,940
Scenario Traffic Stimulation			60%
New Enplaned/Deplaned Passengers			715,164

Source: Statistics Canada Catalogue 51-204 (1992)

Note: For a detailed description of the "Southwest Effect" see The Airline Deregulation Evolution Continues - The Southwest Effect by Randall D. Bennett and James M. Graun, Office of Aviation Analysis, U.S. Department of Transportation (page 6).

4.8 **OPEN SKIES SCENARIO.** An Open Skies agreement would allow Canadian and U.S. carriers access to each other's markets without requiring bi-lateral air rights authorities for each route. This would stimulate new transborder traffic by removing artificial constraints.

Based on generally accepted quality of service indices for aviation traffic stimulation, new non-stop services introduced between transborder city-pairs where intra-line connections are now required would increase current origin-destination traffic by 20%. The traffic

stimulation for Alberta transborder routes with the greatest demand is shown on Table 15.

Table 15
OPEN SKIES DEMAND STIMULATION

U.S. CITY	CURRENT DEMAND enplaned/deplaned	STIMULATION (@20%)
ATLANTA	14,860 passengers	2,972 passengers
BOSTON	18,970	3,794
DETROIT	9,180	1,836
LAS VEGAS	41,110	8,222
MIAMI	27,350	5,470
NEW ORLEANS	10,030	2,006
ORLANDO	24,530	4,906
PORTLAND	7,840	1,568
RENO	4,500	900
SAN DIEGO	13,940	2,788
TAMPA/ST.PETERSBURG	18,210	3,642
WASHINGTON/BALTIMORE	18,710	3,742
TOTAL	209,230 passengers	41,846 passengers

4.9 **AIR CARGO TRANS-SHIPMENT**. This scenario envisions an Alberta Cargo Transit service which matches excess international air cargo capacity (currently eastbound from Europe) with excess trans-border truck capacity southbound to the United States. As an indication of market potential we have assumed that 1% of the current air cargo activity at Denver, Colorado and Salt Lake City (midway between Canada and Mexico along the Interstate Highway 15 and 25 branches of the proposed CANAMEX CORRIDOR) is captured. Table 16 shows the magnitude of this opportunity.

Table 16
CARGO TRANS-SHIPMENT SCENARIO

US Centre	Cargo Volume (tonnes)
SALT LAKE CITY (I15)	125,000
DENVER (I25)	365,000
TOTAL	490,000
TARGET	1%
STIMULATED TRANSIT TRAFFIC	4,900

4.10 **SCENARIO SUMMARY.** The aggregate effects of all scenarios are shown on Table 17. This tabulation applies a factor to each base scenario to generate a forecast demand. Note that both the scenario and the forecast factor are provided to stimulate discussion and are not intended as definitive projections. However, they do provide a point of departure for strategic planning efforts.

Table 17
SCENARIO DEMAND SUMMARY
Potential Additional Airport Activity
(total enplaned plus deplaned passengers/cargo)

PASSENGER SCENARIOS	FORECAST BASE	FORECAST FACTOR	SCENARIO FORECAST
Asia Pacific Spinoff	200,000	40%	80,000
Rocky Mountain Tourism	500,000	20%	100,000
Ethnic Population Travel	250,000	2 x.182	90,000
NAFTA/FTA Impact	10,000	2	20,000
Northern Mine Rotation	20,000	2	40,000
FSU Resource Development			
American Projects	153,400	50%	77,000
Canadian Projects	8,000	100%	8,000
Southwest Effect	1,192,000	60%	715,000
Open Skies Stimulation	209,000	20%	42,000
			1,172,000
CARGO SCENARIOS (en/deplaned cargo in tonnes)			
Northern Mine Supply	2,000	2	4,000
FSU Resource Development:			
American Projects	45,000	50%	22,500
Canadian Projects	1,500	100%	1,500
Air/Truck Trans-shipment	490,000	1%	5,000
			33,000

5. CONSOLIDATED DEMAND FORECAST

The analysis of current demand and the scenario forecasts in this study provides a forecast planning tool for the Alberta Aviation Strategy. This planning tool provides an outlook for Alberta aviation services demand in the Year 2002 (Tables 18 and 19). It is structured to allow for individual interpretations and modifications of the scenario forecasts. Actual demand will depend on how they do or do not unfold. Planners should use the probability factors to make their own evaluations.

Table 18
CONSOLIDATED PASSENGER DEMAND FORECAST (enplaned/deplaned)

DEMAND COMPONENT			PASSENGERS
Alberta Airport Demand (1992)			7,337,000
10 year Traffic Increase @ 1% per annum (1993-2002)			880,000
Normal Demand (2002)			8,217,000
Forecast Scenario Demand:	Passengers	Probability	
Asia/Pacific Spill Over	80,000	50%	40,000
Rocky Mountain Tourism	100,000	75%	75,000
Ethnic Population Travel	90,000	80%	72,000
NAFTA/FTA Impacts	20,000	75%	15,000
Northern Minerals	40,000	100%	40,000
Former Soviet Res Dev	85,000	100%	85,000
Southwest Effect	715,000	50%	357,500
Open Skies	42,000	25%	10,500
CONSOLIDATED FORECAST (2002)			9,389,000

Table 19
CONSOLIDATED CARGO DEMAND FORECAST (tonnes)

DEMAND COMPONENT			CARGO
Alberta Airport Demand (1992)			60,500
10 year Traffic Increase @ 1% per annum (1993-2002)			7,250
Normal Demand (2002)			67,750
Forecast Scenario Demand:	Volume	Probability	
Northern Minerals	4,000	100%	4,000
Former Soviet Union Res Dev	24,000	100%	24,000
Transhipment	5,000	50%	2,500
CONSOLIDATED FORECAST (2002)			98,250

6. STRATEGIC CONSIDERATIONS

An effective Alberta Aviation Strategy requires an objective of making Alberta a destination and/or a transit point. To achieve the objective and realize opportunities, one must understand the driving forces which influence customer and air carrier decision-making. These will vary according to the service being marketed.

As a destination, Alberta's primary selling points for increased service are the combined impact of the Calgary/Edmonton market which is larger than many mid-sized U.S. cities such as Portland. As a transit point, innovative thought processes must be developed, keeping in mind that for Alberta, surface connections must be an integral part of any air services strategy.

Strategic planners must also consider trends affecting the future development of air services. The most important of these are the "Southwest" effect (short haul, low-cost air carriers entering high density, price sensitive markets to challenge high yield operations), "telecommuting" (reducing business travel and increasing the relative importance of tourism travel), "hub busting" (the new regional jet allowing non-stop services between smaller markets at the expense of established hub and spoke operations) and "extended range aircraft" on international service (reducing the need for technical stops).

6.1 AIR CARRIER AND CUSTOMER SERVICE CRITERIA. Air services and their use are a function of air carrier and customer interactions and reactions. These are based on perceptions about the market and the manner in which air services are provided.

Air carriers respond to market opportunities based on:

a) Corporate community of interest in their service(s).
b) Presence of tourist destinations and attractions.
c) Two-way trade value between proposed origin/destination.
d) Ethnic population mix and its relationship to the proposed service.
e) Current origin/destination traffic volumes (passengers and cargo) and current hub

connections.

f) Economic forecasts - economic strength, GDP, average incomes, etc. and how the market relates to other areas.
g) Proposed capital projects in the region.
h) Population and demographics - growth, trading base, propensity to travel, disposable income, etc.
i) Competition - existence of other carriers serving the same or related markets.

Other issues which influence air carrier service decisions include weather, (lack of) congestion, user charges and facility capacity.

Assuming air service is actually provided by a carrier, in the final analysis, service success will reflect customer decision criteria. These criteria depend on specific customer motivations.

- Tourist Travel - cost not time sensitive; looking for added holiday bonus for a more rewarding trip.

- Business Travel - time, comfort and convenience sensitive; looking for best connections.

- Cargo - reliable, consistent, cost effective routings; looking for optimum time/cost trade-off.

With these criteria, a strategic planner may then embark on a strategy for air services from three perspectives which are briefly discussed in the following paragraphs. These are:

- Alberta **Origin** Strategy
- Alberta **Destination** Strategy
- Alberta **Transit** Strategy

6.2 ALBERTA ORIGIN STRATEGY. Stimulating and enhancing opportunities for Alberta origin travel will require strategies which increase the ability for Alberta residents to access non-stop and connecting flights. Such strategies might include:

- Tourist Travel - integrating air and ground transportation to improve access to major Alberta airports and promoting open skies as a mechanism to reduce long haul domestic and transborder fares.

- Business Travel - increasing the number of non-stop and direct services from Alberta to selected destinations and promoting a "southwest" style service on the western triangle.
- Cargo - promoting the development of distributor type operations based in Alberta.

6.3 **ALBERTA DESTINATION STRATEGY.** In order to realize the full market potential of the development scenarios for Alberta origin/destination traffic, service and facility specific strategies will be required to insure that the destination market opportunities are not lost to other competitors. Such strategies might include:

- Tourist Travel - Alberta as a low cost incubator for emerging charter and/or scheduled airlines.
- Business Travel - Alberta as cross-feed connection point matching up unique multiple carrier routings.
- Cargo - Alberta as a major main deck cargo access gateway.

6.4 **ALBERTA TRANSIT STRATEGY.** The opportunity to attract additional aviation activity associated with transit traffic will require aggressive approaches to create value-added Alberta services which will supersede natural routings that would not normally flow through Alberta airports. Service and facility specific strategies might include:

- Tourist Travel - Alberta as a "value added" mini-holiday destination en-route to other tourist venues.
- Business Travel - Alberta as an intermediate en-route de-briefing point for multi-national firms working internationally, especially in oil and gas.
- Cargo - Alberta as a multi-modal trans-shipment centre and final market assembly point.

6.5 CONCLUSIONS and RECOMMENDATIONS

Alberta as an integrated market has significant strengths relative to other competitors in the Pacific Northwest. The Alberta market reaches beyond Alberta to include the Pacific Northwest Region of North America - specifically Vancouver, Spokane, Portland, Seattle

and Alaska as well as Alberta and British Columbia. The realistic market scope for Alberta may be broader or narrower, but it is not Alberta alone. To be successful in this regional marketplace, Alberta airports must work together as Team Alberta, building on the strengths of the individual communities so that they are all winners in an aviation strategy.

There is no reason why Alberta should not target air passenger and cargo traffic, within the broader Pacific Northwest Regional market, that is not now moving through Alberta. In other words, market share could be increased by diverting international air traffic through Alberta that neither originates or terminate here. To obtain this increase in market share requires identification and exploitation of strategic capacity and cost opportunities which may exist in Alberta.

At present there is no overwhelming basis for expecting regional air traffic growth to differentially favour Alberta. That is, for Alberta destination demand, while absolute volumes continue to increase, relative market share in the Northwest North American context does not. This is due, at least in part, to a market which is constrained by lack of competition and regulatory barriers.

The major risk for Alberta is that potential market share could be diverted elsewhere if airport facilities and services and carrier operations are not in place to handle normal increases. On the other hand, Alberta could gain disproportionate market growth with coordinated airport and carrier packages customized to capture external market segments.

Both of these situations require opportunity identification to match special Alberta capability with demand pockets in the Pacific Northwest market as well as in the local origin/destination market. Airport action in this regard must of necessity be reactive to the normal growth in Alberta air traffic activity. It must be taken in time to protect and expand Alberta cargo activity within the local market scope.

APPENDIX A

List of Interviews

Advance Air Charter

Air Canada

Anchorage Airport

Calgary Airports Authority

Canadian Airlines International

Corp Air

Edmonton Regional Airports Authority

Fairbanks Airport

Great Falls Airport

Portland Airport

Powell Travel, a division of Mack Travel

SeaTac Airport

Spokane Airport

ethnic.wq1					APPENDIX B			
23-May-94								
Canadian Population by Ethnic Origin								
Single Origin	1981	1986	1991		Multiple Origin	1981	1986	1991
Italy	747970	709590	750055		Italy	747970	1006915	1147775
Portugal	188105	199595	246890		Portugal	188105	237180	292185
Ukraine	529615	420210	406645		Ukraine	529615	961310	1054295
Poland	254485	222260	272805		Poland	254485	612105	740710
Hungary	116395	97845	100725		Hungary	116395	189000	213700
Czech	67700	18835	59125		Czech	67700	43440	71428
Chile	5710	8070	12800		Chile	5710	10375	16450
China	289245	360315	586645		China	289245	414040	652645
Vietnam	31360	53015	84010		Vietnam	31360	62990	94255
TOTAL	24343180	25309331	27296859		TOTAL	24343180	25309331	27296859
Source: Statistics Canada 93-154								

Non-resident Travellers Entering Canada					Travel Propensity (# trips/capita)			
Country	1981	1986	1991		Country	Non-residents		
Italy	65783	80505	99873		Italy	0.088	0.080	0.087
Portugal	12318	19575	13507		Portugal	0.065	0.083	0.046
Ukraine					Ukraine			
Poland	15708	26424			Poland	0.062	0.043	
Hungary	6736	7530			Hungary	0.058	0.040	
Czech	4594	5907			Czech	0.068	0.136	
USSR	4924	6355			USSR			
	---------	---------	---------					
TOTAL EUROPE	1350651	1304810	1792773		TOTAL EUROPE			
	=========	=========	=========					
Chile					Chile			
	---------	---------	---------					
TOTAL S.A.	88401	71982	104412		TOTAL S.A.			
	=========	=========	=========					
China	7478	15740			China	0.026	0.038	
Vietnam					Vietnam			
	---------	---------	---------					
TOTAL ASIA	391494	564234	966180		TOTAL ASIA			
	=========	=========	=========					
					All Origins			

ALL COUNTRIES	1390620	1480490	2166751		Non-Res	0.057	0.058	0.079
Canadian Residents Returning to Canada								
ALL COUNTRIES	1455814	2272141	2810786		Res	0.060	0.090	0.103
Res & Non-Res	2846434	3752631	4977537		Res + Non-Res	0.117	0.148	0.182

APPENDIXFORMER SOVIET UNION RESOURCE DEVELOPMENT PROJECTS

	SCOPE	DURATION	COST	TONNES	PAX
PRODUCTION PROJECTS					
Amoco/Yamal Peninsula	13 Bbls	50 years	$20B		
Chevron/Tengis-Korolev	9 Bbls	50 years	$20B		
Amoco/Priobskoye	5 Bbls	50 years	$10B		
Marathon/Sakalin Is.	3 Bbls	25 years	$ 8B		
Amoco/Azeria-Chiraq	3 Bbls	25 years	$ 7B		
Texaco/Timan-Pechora	2.5 Bbls	25 years	$ 5B		
Petro-Hunt/Khanty-Mans	2.5 Bbls	25 years	$ 2B		
AVERAGE:		35 years	$2B/yr		
ANNUAL CARGO (@ 5 tonnes/$1 million)				10,000	
ANNUAL WORKFORCE (@ 2018/$1 billion)					4,036
PIPELINE PROJECTS					
Enron/Caspian (4800 km)	4 Bcfd	1995-2000	$16B		
Monenco/Yamal (2500 km)	6 Bcfd	1995-2010	$10B		
Bechtel/Tengiz Oil	1.5 MMbpd	1997-2000	$ 2B		
AVERAGE		7 years	$4B/yr		
ANNUAL CARGO (@5 tonnes/$1 million)				20,000	
ANNUAL WORKFORCE (@3460/$1 billion)					13,840
TOTAL CARGO ESTIMATE				30,000	
RETROGRADE ALLOWANCE (150%)				45,000	
TOTAL WORKFORCE ESTIMATE					17,876
NORTH AMERICAN WORKFORCE (@33%)					5,900
ROTATION COUNTERPARTS (X2)					11,800
ROTATION EN/DEPLANED (@13/yr)					153,400
CANADIAN PROJECTS					
Gulf/Komi Arctic Oil	.3 Bbls	1990-2010	$1.0 B		
Hurricane/Dzhazkazgan	.25 Bbls	1997-2000	$0.7 B		
Fracmaster/Siberia workovers		1990-2010	$0.3 B		
Beta Well/Siberia workovers		1990-2000	$0.1 B		
Bonus Petrol/Kazakhstan workovers		1995-2000	$0.1 B		
AVERAGE		12 years	$0.2 B/yr		
ANNUAL CARGO (@5 tonnes/$1 million)				1,000	
RETROGRADE ALLOWANCE (@150%)				1,500	
ANNUAL WORKFORCE (@2018/$1 billion)					400
CANADIAN COMPONENT (@75%)					300
ROTATION COUNTERPARTS (x2)					600
ROTATION EN/DEPLANED (@13/yr)					7,900

NOTES: 1) All projects are planned to start before the year 2000.
2) Project Scope in Billion Barrels of Oil (Bbls) or Billion Cubic Feet/Day of Gas (Bcfd).
3) Cost is estimated in US $ Billions (B).

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